

CLAIMS

That which is claimed is:

1. An organic nucleating agent which induces b-axis orientation within a test homopolymer polypropylene formulation to a degree in which a relative angle (ND) of greater than 13.5 is detected, wherein the unnnucleated test homopolymer polypropylene formulation exhibits a density of about 0.9 g/cc, a melt flow of about 12 g/10 min, a Rockwell Hardness (R scale) of about 90, a tensile strength of about 4,931 psi, an elongation at yield of about 10%, a flexural modulus of about 203 kpi, an Izod impact strength of about 0.67 ft-lb/in, and a deflection temperature at 0.46 mPa of about 93°, and wherein said formulation comprising said combination is extruded then molded into plaques having dimensions of about 51 mm X 76 mm X 3.00 mm, wherein the total amount of said organic nucleating agent present within said test homopolymer is at most 0.25% by weight.
2. A thermoplastic composition comprising the organic nucleating agent as defined in Claim 1.
3. The thermoplastic composition of Claim 2 wherein said thermoplastic is a polyolefin.
4. The polyolefin composition of Claim 3 wherein said polyolefin is a polypropylene.

5. An organic nucleating agent which induces a stiffness to impact balance ratio (S/I) of greater than 4.5 within a test homopolymer polypropylene formulation, wherein the unnnucleated test homopolymer polypropylene formulation exhibits a density of about 0.9 g/cc, a melt flow of about 12 g/10 min, a Rockwell Hardness (R scale) of about 90, a tensile strength of about 4,931 psi, an elongation at yield of about 10%, a flexural modulus of about 203 ksi, an Izod impact strength of about 0.67 ft-lb/in, and a deflection temperature at 0.46 mPa of about 93°, and wherein said formulation comprising said combination is extruded then molded into plaques having dimensions of about 51 mm X 76 mm X 3.00 mm, wherein the total amount of said organic nucleating agent present within said test homopolymer is at most 0.25% by weight.

6. A thermoplastic composition comprising the organic nucleating agent as defined in Claim 5.

7. The thermoplastic composition of Claim 6 wherein said thermoplastic is a polyolefin.

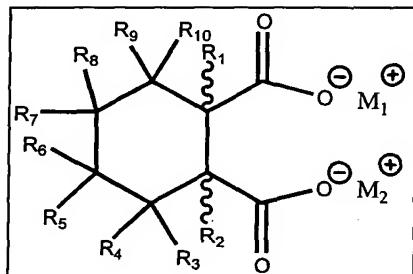
8. The polyolefin composition of Claim 7 wherein said polyolefin is a polypropylene.

9. A polypropylene article comprising at least one cyclic dicarboxylate nucleating agent, wherein said polypropylene comprises at least a fraction of homopolymer and exhibits a b-

axis orientation, wherein said at least one nucleating agent exhibits very low hygroscopicity, and wherein said at least one nucleating agent induces a crystallization temperature of at least 116°C within a test homopolymer propylene formulation, wherein the unnnucleated test homopolymer propylene formulation exhibits a density of about 0.9 g/cc, a melt flow of about 12 g/10 min, a Rockwell Hardness (R scale) of about 90, a tensile strength of about 4,931 psi, an elongation at yield of about 10%, a flexural modulus of about 203 ksi, an Izod impact strength of about 0.67 ft-lb/in, and a deflection temperature at 0.46 mPa of about 93°, and wherein said formulation comprising said combination is extruded then molded into plaques having dimensions of about 51 mm X 76 mm X 3.00 mm, wherein said peak crystallization temperature is measured by differential scanning calorimetry in accordance with a modified ASTM Test Method D3417-99 at heating and cooling rates of 20°C/minute, wherein the total amount of said organic nucleating agent present within said test homopolymer is at most 0.25% by weight.

10. The polypropylene article of Claim 9 wherein said nucleating compound is a metal salt of the compound conforming to Formula (I)

(I)

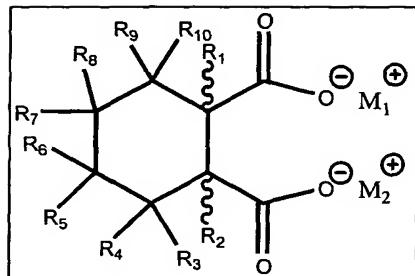


wherein M_1 and M_2 are the same or different and are selected from at least one Group I or Group II metal cation, and wherein R_1 , R_2 , R_3 , R_4 , R_5 , R_6 , R_7 , R_8 , R_9 , and R_{10} are either the same or different and are individually selected from the group consisting of hydrogen, C₁-C₉ alkyl, wherein any two vicinal or geminal alkyl groups may be combined to form a carbocyclic ring of up to six carbon atoms, hydroxy, C₁-C₉ alkoxy, C₁-C₉ alkyleneoxy, amine, and C₁-C₉ alkylamine, halogens, and phenyl.

11. The article of Claim 10 wherein each of R_1 , R_2 , R_3 , R_4 , R_5 , R_6 , R_7 , R_8 , R_9 , and R_{10} are hydrogen and M_1 and M_2 are combined as a single calcium ion.

12. The article of Claim 8 wherein said nucleating compound is a metal salt of the compound conforming to Formula (I)

(I)



wherein M₁ and M₂ are the same or different and are selected from at least one Group I or Group II metal cation, and wherein R₁, R₂, R₃, R₄, R₅, R₆, R₇, R₈, R₉, and R₁₀ are either the same or different and are individually selected from the group consisting of hydrogen, C₁-C₉ alkyl, wherein any two vicinal or geminal alkyl groups may be combined to form a carbocyclic ring of up to six carbon atoms, hydroxy, C₁-C₉ alkoxy, C₁-C₉ alkyleneoxy, amine, and C₁-C₉ alkylamine, halogens, and phenyl.

13. The article of Claim 12 wherein each of R₁, R₂, R₃, R₄, R₅, R₆, R₇, R₈, R₉, and R₁₀ are hydrogen and M₁ and M₂ are combined as a single calcium ion.